Heat Stress

Environmental factors contributing to heat stress include air temperature, humidity, radiant heat exchange, and wind.

Temperature (F) versus Relative Humidity (%)

°F	90%	80%	70%	60%	50%	40%
80	85	84	82	81	80	79
85	101	96	92	90	86	84
90	121	113	105	99	94	90
95		133	122	113	105	98
100			142	129	118	109
105				148	133	121
110						135

HI	Possible Heat Disorder:
80°F - 90°F	Fatigue possible with prolonged exposure and physical activity.
90°F - 105°F	Sunstroke, heat cramps and heat exhaustion possible.
105°F - 130°F	Sunstroke, heat cramps, and heat exhaustion likely, and heat stroke possible.
130°F or greater	**Heat stroke highly likely with continued exposure.**

Below is a table comparing Temperature and Dewpoint, with the same disorders possible:

Temperature (Down) versus Dewpoint (across)

°F	55	60	65	70	75	80	85
80	80	80	81	83	84	87	
85		84	86	89	93	99	107
90			91	95	100	107	117
95				101	106	114	125
100					113	121	131
105						127	138
110						134	145

Physical work also contributes to the total heat stress by producing metabolic heat in the body, proportional to the intensity of work.

Heavy physical labor can greatly increase the likelihood of heat fatigue, heat exhaustion, and heat stroke, the latter being a life-threatening condition.

Personnel monitoring for heat stress will commence when the ambient temperature is 80°F (70°F if chemical protective clothing is worn) or above.

Frequency of monitoring will increase as the ambient temperature rises.

Various control measures will be employed if heat stress becomes a problem, including:

- Providing liquids to replace lost body fluids (water is preferable, other drinks have sugar which actually increases the body's heat output).
- Establishing a work regimen that allows personnel rest periods to cool down. (15 minutes rest for every 45 minutes of work).
- Training workers to recognize and prevent heat stress.
- Establishing a "re-hab" area which is climate controlled This can be sitting in a running, air conditioned car for 10 to 20 minutes

All workers are to be alert to the possibility and symptoms of heat stress.

Should the worker experience extreme fatigue, cramps, dizziness, headache, nausea, profuse sweating, or pale, clammy skin, the worker and the safety officer will take control measures.

If the symptoms do not subside after a reasonable rest period, the Safety Officer will seek medical assistance.

All workers should be familiar with the signs of heat stress disorders:

Heat cramps

are caused by heavy sweating and inadequate electrolyte replacement. Signs and symptoms include muscle spasms and pain in the hands, feet, and abdomen.

Heat exhaustion

occurs from increased stress on various body organs. Signs and symptoms include pale, cool, moist skin, heavy sweating, dizziness, nausea, and fainting.

Heat stroke

is the most serious form of heat stress and should always be treated as a medical emergency. During heat stroke, the body's temperature regulation system fails, and the body temperature rapidly rises to critical levels. Immediate action must be taken to cool the body before serious injury or death occurs. Signs and symptoms of heat stroke include:

- Red, hot, unnaturally dry skin.
- Lack of, or reduced, perspiration.

- Nausea.
- Dizziness and confusion (to the point of being unresponsive)
- Strong, rapid pulse, and confusion.
- Coma
- Death

To prevent heat stress, the following practices will be implemented:

- Drink plenty of water and fluids containing electrolytes throughout the day
- Drinking water will be kept cool (50 to 60°F) to encourage workers to drink frequently.
- A work regimen that will provide adequate rest periods for cooling down will be established, as required.
- All workers will be advised of the dangers and symptoms of heat stroke, heat exhaustion, and heat cramps.
- Workers will be instructed to monitor themselves and coworkers for signs of heat stress and to take additional breaks, as necessary.
- A shaded rest area will be provided. All breaks will take place in the shaded rest area.
- Workers will not be assigned to other tasks during breaks.
- Workers will remove impermeable garments during rest periods.
- All workers will be informed of the importance of adequate rest, acclimation, and proper diet in the prevention of heat stress disorders.